

Serial Number: 09/545,199**ENTERED**☐

Changed a file from non-ASCII to ASCII

☐

Changed the margins in cases where the sequence text was "wrapped" down to the next line.

☐

Edited a format error in the Current Application Data section, specifically:

☐Edited the Current Application Data section with the actual current number. The number inputted by the applicant was ☐ the prior application data; or ☐ other \_\_\_\_\_☐

Added the mandatory heading and subheadings for "Current Application Data".

☐

Edited the "Number of Sequences" field. The applicant spelled out a number instead of using an integer.

☐

Changed the spelling of a mandatory field (the headings or subheadings), specifically:

☐

Corrected the SEQ ID NO when obviously incorrect. The sequence numbers that were edited were:

☐

Inserted or corrected a nucleic number at the end of a nucleic line. SEQ ID NO's edited:

☐

Corrected subheading placement. All responses must be on the same line as each subheading. If the applicant placed a response below the subheading, this was moved to its appropriate place.

☐

Inserted colons after headings/subheadings. Headings edited included:

☐

Deleted extra, invalid, headings used by an applicant, specifically:

☐Deleted: ☐ non-ASCII "garbage" at the beginning/end of files; ☐ secretary initials/filename at end of file;  
☐ page numbers throughout text; ☐ other invalid text, such as \_\_\_\_\_☐

Inserted mandatory headings, specifically: \_\_\_\_\_

☐

Corrected an obvious error in the response, specifically:

☐

Edited identifiers where upper case is used but lower case is required, or vice versa.

☐

Corrected an error in the Number of Sequences field, specifically:

☐

A "Hard Page Break" code was inserted by the applicant. All occurrences had to be deleted.

☐

Deleted ending stop codon in amino acid sequences and adjusted the "(A)Length:" field accordingly (error due to a PatentIn bug). Sequences corrected: \_\_\_\_\_

☒Other: Seq 16 - aligned amino acid nos.

Examiner: The above corrections must be communicated to the applicant in the first Office Action. DO NOT send a copy of this form.

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/545,199D

DATE: 10/29/2001

TIME: 17:57:09

Input Set : A:\PTO.AMC.txt

Output Set: N:\CRF3\10292001\I545199D.raw

PS

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3 <110> APPLICANT: Lowery E., David
4     Fuller E., Troy
5     Kennedy J., Michael
7 <120> TITLE OF INVENTION: Anti-Bacterial Vaccine Compositions
9 <130> FILE REFERENCE: 28341/6227.1
11 <140> CURRENT APPLICATION NUMBER: 09/545,199D
12 <141> CURRENT FILING DATE: 2000-04-06
14 <150> PRIOR APPLICATION NUMBER: 60/153,453
15 <151> PRIOR FILING DATE: 1999-09-10
17 <150> PRIOR APPLICATION NUMBER: 60/128,689
18 <151> PRIOR FILING DATE: 1999-04-09
20 <160> NUMBER OF SEQ ID NOS: 169
22 <170> SOFTWARE: PatentIn Ver. 2.0
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25 <211> LENGTH: 1112
26 <212> TYPE: DNA
27 <213> ORGANISM: Pasteurella multocida
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33 <220> FEATURE:
34 <223> OTHER INFORMATION: atpB
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37 <221> NAME/KEY: misc_feature
38 <222> LOCATION: 1099
39 <223> OTHER INFORMATION: n = A or T or G or C
41 <220> FEATURE:
42 <221> NAME/KEY: misc_feature
43 <222> LOCATION: 1104
44 <223> OTHER INFORMATION: n = A or T or G or C
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49 acttgctttt aaactgttca attcaatgca ttttattgca tttttgttg gatattttat 120
51 aacaatagtt ttaaacaata ttcttcatt ttttataagt aagtacttaa atataaagca 180
53 ttttcataaa tatcaataaa ggattagtt atg gca gca gag ctt aca aca gcg 233
54                                     Met Ala Ala Glu Leu Thr Thr Ala
55                                     1               5
59 gga tat att ggg cac cat tta gca ttc ttg aaa aca ggg gat tct ttc 281
60 Gly Tyr Ile Gly His His Leu Ala Phe Leu Lys Thr Gly Asp Ser Phe
61 10               15               20
64 tgg cat gtt cat tta gat acc ctt cta ttt tca att att tca ggt gca 329
65 Trp His Val His Leu Asp Thr Leu Leu Phe Ser Ile Ile Ser Gly Ala
66 25               30               35               40
68 att ttt ctt ttt gtt ttt tca aaa gtt gca aaa aaa gca acg ccg ggt 377
69 Ile Phe Leu Phe Val Phe Ser Lys Val Ala Lys Lys Ala Thr Pro Gly
70 45               50               55
72 gtg cct agc aag atg caa tgt ttt gtt gag ata atg gtt gat tgg att 425

```

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73 Val Pro Ser Lys Met Gln Cys Phe Val Glu Ile Met Val Asp Trp Ile
74          60          65          70
76 gat ggg atc gta aaa gaa aat ttc cat ggt cct cgt cat gct gtt gga 473
77 Asp Gly Ile Val Lys Glu Asn Phe His Gly Pro Arg His Ala Val Gly
78          75          80          85
80 cca tta gca tta act att ttc tgc tgg gta ttc att atg aat gct atc 521
81 Pro Leu Ala Leu Thr Ile Phe Cys Trp Val Phe Ile Met Asn Ala Ile
82          90          95          100
84 gat ttg atc cca gta gat ttc cta cct caa tta gcc cat tta ttt ggt 569
85 Asp Leu Ile Pro Val Asp Phe Leu Pro Gln Leu Ala His Leu Phe Gly
86 105          110          115          120
88 att gaa tac tta aga gct gtt cca aca gca gat atc agt gga aca tta 617
89 Ile Glu Tyr Leu Arg Ala Val Pro Thr Ala Asp Ile Ser Gly Thr Leu
90          125          130          135
92 ggc tta tca att ggt gtc ttc ttc tta att att ttc tat aca atc aaa 665
93 Gly Leu Ser Ile Gly Val Phe Phe Leu Ile Ile Phe Tyr Thr Ile Lys
94          140          145          150
96 tca aaa ggt atg agt ggc ttt gtt aaa gaa tat acg ctt cat cct ttt 713
97 Ser Lys Gly Met Ser Gly Phe Val Lys Glu Tyr Thr Leu His Pro Phe
98          155          160          165
100 aat cat cct ttg tta att ccg gtt aac tta gcg ctt gaa tca gtc aca 761
101 Asn His Pro Leu Leu Ile Pro Val Asn Leu Ala Leu Glu Ser Val Thr
102          170          175          180
104 tta tta gca aaa cct gtt tct ttg gcg ttc cgt ctt ttc ggg aat atg 809
105 Leu Leu Ala Lys Pro Val Ser Leu Ala Phe Arg Leu Phe Gly Asn Met
106 185          190          195          200
108 tat gca ggt gaa ctt atc ttt att ctt att gca gtg atg tac atg gca 857
109 Tyr Ala Gly Glu Leu Ile Phe Ile Leu Ile Ala Val Met Tyr Met Ala
110          205          210          215
112 aat aat ttt gca ctt aat tca atg ggt att ttc atg cat ttg gct tgg 905
113 Asn Asn Phe Ala Leu Asn Ser Met Gly Ile Phe Met His Leu Ala Trp
114          220          225          230
117 gct att ttc cat att ctt gtg att acc tta caa gca ttt att ttt atg 953
118 Ala Ile Phe His Ile Leu Val Ile Thr Leu Gln Ala Phe Ile Phe Met
119          235          240          245
121 atg ctt aca gtg gtt tat ttg agt atg ggt tat aac aaa gca gaa cac 1001
122 Met Leu Thr Val Val Tyr Leu Ser Met Gly Tyr Asn Lys Ala Glu His
123          250          255          260
125 taatttttta taaacaaaac cagaccttgg gtctaaattt caatcttatg gagaacatta 1061
127 tggaacactg taattactac aacaatcatc gcactctgnaa ttnttcttgc t 1112
130 <210> SEQ ID NO: 2
131 <211> LENGTH: 264
132 <212> TYPE: PRT
133 <213> ORGANISM: Pasteurella multocida
135 <400> SEQUENCE: 2
136 Met Ala Ala Glu Leu Thr Thr Ala Gly Tyr Ile Gly His His Leu Ala
137 1 5 10 15
139 Phe Leu Lys Thr Gly Asp Ser Phe Trp His Val His Leu Asp Thr Leu
140 20 25 30

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142 Leu Phe Ser Ile Ile Ser Gly Ala Ile Phe Leu Phe Val Phe Ser Lys
143      35      40      45
145 Val Ala Lys Lys Ala Thr Pro Gly Val Pro Ser Lys Met Gln Cys Phe
146      50      55      60
148 Val Glu Ile Met Val Asp Trp Ile Asp Gly Ile Val Lys Glu Asn Phe
149      65      70      75      80
151 His Gly Pro Arg His Ala Val Gly Pro Leu Ala Leu Thr Ile Phe Cys
152      85      90      95
154 Trp Val Phe Ile Met Asn Ala Ile Asp Leu Ile Pro Val Asp Phe Leu
155      100     105     110
157 Pro Gln Leu Ala His Leu Phe Gly Ile Glu Tyr Leu Arg Ala Val Pro
158      115     120     125
160 Thr Ala Asp Ile Ser Gly Thr Leu Gly Leu Ser Ile Gly Val Phe Phe
161      130     135     140
163 Leu Ile Ile Phe Tyr Thr Ile Lys Ser Lys Gly Met Ser Gly Phe Val
164 145      150      155      160
166 Lys Glu Tyr Thr Leu His Pro Phe Asn His Pro Leu Leu Ile Pro Val
167      165      170      175
169 Asn Leu Ala Leu Glu Ser Val Thr Leu Leu Ala Lys Pro Val Ser Leu
170      180      185      190
172 Ala Phe Arg Leu Phe Gly Asn Met Tyr Ala Gly Glu Leu Ile Phe Ile
173      195      200      205
175 Leu Ile Ala Val Met Tyr Met Ala Asn Asn Phe Ala Leu Asn Ser Met
176      210      215      220
178 Gly Ile Phe Met His Leu Ala Trp Ala Ile Phe His Ile Leu Val Ile
179 225      230      235      240
181 Thr Leu Gln Ala Phe Ile Phe Met Met Leu Thr Val Val Tyr Leu Ser
182      245      250      255
184 Met Gly Tyr Asn Lys Ala Glu His
185      260
188 <210> SEQ ID NO: 3
189 <211> LENGTH: 1972
190 <212> TYPE: DNA
191 <213> ORGANISM: Pasteurella multocida
193 <220> FEATURE:
194 <221> NAME/KEY: CDS
195 <222> LOCATION: (364)..(1230)
197 <220> FEATURE:
198 <223> OTHER INFORMATION: atpG
200 <400> SEQUENCE: 3
201 agcggggccat ttggctcagt tcggcttcgg attccttatga tgcacacgta agcaattatc 60
203 acatgggtcaa aaagtaactg aattattgaa acaaaaccaa tactctccgt tatctgtagc 120
205 acaacaagca ttagtgttat ttgcagtaga gtttggttac ttagaagaag tggacttaga 180
207 tcgtattggt tcatttgaat cagcactttt agagtatgct aaccataact atgctgattt 240
209 tatgcgtgag ttaacccaat ctggcaatta caatgatgaa attaaagagt cattaagagg 300
211 cattttggat agcttcaaag caaacagtgc gtggttaagtt aacactttta atggagagac 360
213 aaa atg gca ggt gct aaa gag ata aga acc aaa atc gcg agt gta aaa 408
214 Met Ala Gly Ala Lys Glu Ile Arg Thr Lys Ile Ala Ser Val Lys
215      1      5      10      15

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## RAW SEQUENCE LISTING

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Input Set : A:\PTO.AMC.txt

Output Set: N:\CRF3\10292001\I545199D.raw

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217 agt aca caa aaa att act aaa gcg atg gaa atg gtt gct gcc tcg aaa 456
218 Ser Thr Gln Lys Ile Thr Lys Ala Met Glu Met Val Ala Ala Ser Lys
219          20          25          30
221 atg cgt aaa acg caa gaa cgc atg tct tct tca cgc cct tat tca gaa 504
222 Met Arg Lys Thr Gln Glu Arg Met Ser Ser Ser Arg Pro Tyr Ser Glu
223          35          40          45
225 aca ata cgt aac gtg att agc cac gtt tcc aaa gca acg att ggt tac 552
226 Thr Ile Arg Asn Val Ile Ser His Val Ser Lys Ala Thr Ile Gly Tyr
227          50          55          60
229 aag cat cca ttt tta gtg gat cgc gaa gta aaa aaa gtg ggc atg att 600
230 Lys His Pro Phe Leu Val Asp Arg Glu Val Lys Lys Val Gly Met Ile
231          65          70          75
233 gtt gtg tcc aca gat cgt ggt ctt tgt ggt ggc tta aac gtg aac ttg 648
234 Val Val Ser Thr Asp Arg Gly Leu Cys Gly Gly Leu Asn Val Asn Leu
235 80          85          90          95
237 ttt aaa act gta tta aat gaa atg aaa gaa tgg aaa gaa aaa gat gtt 696
238 Phe Lys Thr Val Leu Asn Glu Met Lys Glu Trp Lys Glu Lys Asp Val
239          100          105          110
241 tcc gtt caa ttg agt tta atc ggt tct aaa tct atc aac ttt ttc caa 744
242 Ser Val Gln Leu Ser Leu Ile Gly Ser Lys Ser Ile Asn Phe Phe Gln
243          115          120          125
245 tct ttg gga att aaa att tta acc caa gat tca ggt att ggt gat act 792
246 Ser Leu Gly Ile Lys Ile Leu Thr Gln Asp Ser Gly Ile Gly Asp Thr
247          130          135          140
249 ccc tct gtt gag cag tta att ggt tca gtc aat tct atg att gat gct 840
250 Pro Ser Val Glu Gln Leu Ile Gly Ser Val Asn Ser Met Ile Asp Ala
251          145          150          155
253 tat aaa aaa ggg gaa gta gat gtt gtg tat tta gtt tat aac aaa ttt 888
254 Tyr Lys Lys Gly Glu Val Asp Val Val Tyr Leu Val Tyr Asn Lys Phe
255 160          165          170          175
257 att aac acg atg tcg caa aag cca gta ttg gaa aaa tta att cca tta 936
258 Ile Asn Thr Met Ser Gln Lys Pro Val Leu Glu Lys Leu Ile Pro Leu
259          180          185          190
261 cca gaa tta gat aat gat gaa tta ggc gaa aga aaa caa gtt tgg gat 984
262 Pro Glu Leu Asp Asn Asp Glu Leu Gly Glu Arg Lys Gln Val Trp Asp
263          195          200          205
265 tat att tac gaa cct gat gcg aaa gta tta tta gat aat tta ttg gtt 1032
266 Tyr Ile Tyr Glu Pro Asp Ala Lys Val Leu Leu Asp Asn Leu Leu Val
267          210          215          220
269 cgt tat tta gaa tct cag gtt tat caa gca gca gtt gaa aac ctt gct 1080
270 Arg Tyr Leu Glu Ser Gln Val Tyr Gln Ala Ala Val Glu Asn Leu Ala
271          225          230          235
273 tct gag caa gcc gct cga atg gtc gcc atg aaa gca gca aca gat aac 1128
274 Ser Glu Gln Ala Ala Arg Met Val Ala Met Lys Ala Ala Thr Asp Asn
275 240          245          250          255
277 gca ggt aac tta att aat gag tta cag tta gtc tat aac aaa gct cgt 1176
278 Ala Gly Asn Leu Ile Asn Glu Leu Gln Leu Val Tyr Asn Lys Ala Arg
279          260          265          270
281 caa gca agt att aca aat gaa tta aat gaa att gtt gcc ggt gca gca 1224

```

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TIME: 17:57:09

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Output Set: N:\CRF3\10292001\I545199D.raw

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282 Gln Ala Ser Ile Thr Asn Glu Leu Asn Glu Ile Val Ala Gly Ala Ala
283          275          280          285
285 gca att taacaaatag aggatcggta atggcaactg gaaaaattgt acaaatcatc 1280
286 Ala Ile
288 ggtgcggtta ttgacgttga attcccacaa gatgcagtac caaaagtata tgatgcctta 1340
290 aatgttgaaa caggttttagt acttgaagtt caacaacaat taggtggtgg ttagtttcgc 1400
292 tgtatcgcaa tgggatcatc tgatggatta aaacgcggtt taagcgtaac aaatacgaat 1460
294 aacccaatth ctgttccagt gggaacgaaa acattgggtc gtatcatgaa cgtattgggt 1520
296 gaaccaatcg atgagcaagg tgaaatcggg gcagaagaga attggtctat tcaccgtgcg 1580
298 ccaccaagtt atgaagaaca atctaacagt actgaacttt tagaaacggg aattaaagtt 1640
300 atcgacttag tttgtccggt tgcgaaaggg ggtaaagtag gtttattcgg tgggtgcgggt 1700
302 gtcggtaaaa ccgtcaatat gatggaatta atccgtaaca tcgcaattga gcaactcagg 1760
304 tactctgtct ttgcgggggt aggtgagcgt acgcgtgaag gtaacgactt ctatcatgag 1820
306 atgaaagact ctaacgtatt agataaagtg tctcttgttt atgggtcaaat gaacgagcca 1880
308 ccaggtaacc gtttacgtgt ggcattaaca ggcttaacta tggcggaaaa attccgtgat 1940
310 gaaggtcgtg atgtcttatt ctctgttgat aa 1972
313 <210> SEQ ID NO: 4
314 <211> LENGTH: 289
315 <212> TYPE: PRT
316 <213> ORGANISM: Pasteurella multocida
318 <400> SEQUENCE: 4
319 Met Ala Gly Ala Lys Glu Ile Arg Thr Lys Ile Ala Ser Val Lys Ser
320 1 5 10 15
322 Thr Gln Lys Ile Thr Lys Ala Met Glu Met Val Ala Ala Ser Lys Met
323 20 25 30
325 Arg Lys Thr Gln Glu Arg Met Ser Ser Arg Pro Tyr Ser Glu Thr
326 35 40 45
328 Ile Arg Asn Val Ile Ser His Val Ser Lys Ala Thr Ile Gly Tyr Lys
329 50 55 60
331 His Pro Phe Leu Val Asp Arg Glu Val Lys Lys Val Gly Met Ile Val
332 65 70 75 80
334 Val Ser Thr Asp Arg Gly Leu Cys Gly Gly Leu Asn Val Asn Leu Phe
335 85 90 95
337 Lys Thr Val Leu Asn Glu Met Lys Glu Trp Lys Glu Lys Asp Val Ser
338 100 105 110
340 Val Gln Leu Ser Leu Ile Gly Ser Lys Ser Ile Asn Phe Phe Gln Ser
341 115 120 125
343 Leu Gly Ile Lys Ile Leu Thr Gln Asp Ser Gly Ile Gly Asp Thr Pro
344 130 135 140
346 Ser Val Glu Gln Leu Ile Gly Ser Val Asn Ser Met Ile Asp Ala Tyr
347 145 150 155 160
349 Lys Lys Gly Glu Val Asp Val Val Tyr Leu Val Tyr Asn Lys Phe Ile
350 165 170 175
352 Asn Thr Met Ser Gln Lys Pro Val Leu Glu Lys Leu Ile Pro Leu Pro
353 180 185 190
355 Glu Leu Asp Asn Asp Glu Leu Gly Glu Arg Lys Gln Val Trp Asp Tyr
356 195 200 205
358 Ile Tyr Glu Pro Asp Ala Lys Val Leu Leu Asp Asn Leu Leu Val Arg
359 210 215 220

```

Use of n and/or Xaa has been detected in the Sequence Listing.

Review the Sequence Listing to insure a corresponding explanation is presented in the <220> to <223> fields of each sequence using n or Xaa.

## VERIFICATION SUMMARY

PATENT APPLICATION: US/09/545,199D

DATE: 10/29/2001

TIME: 17:57:10

Input Set : A:\PTO.AMC.txt

Output Set: N:\CRF3\10292001\I545199D.raw

L:127 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1  
L:3839 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27  
L:3840 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27  
L:3843 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27  
L:3844 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27  
L:3847 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27  
L:3848 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27  
L:3979 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:28  
L:3982 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:28  
L:3985 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:28  
L:5414 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:35  
L:5415 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:35  
L:5426 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:35  
L:5427 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:35  
L:5442 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:35  
L:5450 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:35  
L:5524 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:36  
L:5527 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:36  
L:5533 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:36  
L:5536 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:36  
L:5610 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:37  
L:5611 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:37  
L:5626 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:37  
L:5627 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:37  
L:5659 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:37  
L:5661 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:37  
L:5687 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:37  
L:5689 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:37  
L:5726 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:38  
L:5738 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:38  
L:5856 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:39  
L:6788 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:47  
L:9357 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:72  
L:11241 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:90  
L:11243 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:90  
L:11976 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:102  
L:11977 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:102  
L:12304 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:103